Name: _____ Class: _____ Date: _____

Solving Multi-Step Equations

A general strategy for solving equations is to first simplify each side of the equation. Next isolate the variable on one side and the constants on the other by adding equal values on both sides of the equation or removing balanced sets or zeros. Finally determine the value of the variable–usually by division.

Note: When the process of solving an equation ends with different numbers on each side of the equal sign (for example, $2 = 4$), there is *no solution* to the problem. When the result is the same expression or number on each side of the equation (for example, $x + 2 = x + 2$) it means that *all numbers* are solutions.

Example 1: **Solve $3x + 3x - 1 = 4x + 9$**

Solution		
	$3x+3x-1=4x+9$	problem
	$6x-1=4x+9$	simplify by combining like terms
	$2x=10$	add 1, subtract $4x$ on each side
	$x=5$	divide by 2

Example 2: Solve $-2x + 1 + 3(x - 1) = -4 + -x - 2$

Solution		
	$-2x+1+3(x-1)=-4+-x-2$	problem
	$-2x+1+3x-3=-x-6$	distribute the 3 on the left side
	$x-2=-x-6$	simplify by combining like terms
	$2x=-4$	add x, add 2 to each side
	$x=-2$	divide by 2

DIRECTIONS: On a SEPARATE piece of paper, write the original equation and clearly show **each** step of your solution. Be sure to **check** your answer in writing, as shown in class.

1. $2x + 3 = -7$
2. $-3x - 2 = -1$
3. $3x + 2 + x = x + 5$
4. $4x - 2 - 2x = x - 5$
5. $2x - 3 = -x + 3$
6. $1 + 3x - x = x - 4 + 2x$
7. $4 - 3x = 2x - 6$
8. $3 + 3x - x + 2 = 3x + 4$
9. $-x - 3 = 2x - 6$
10. $-4 + 3x - 1 = 2x + 1 + 2x$
11. $-x + 3 = 6$
12. $5x - 3 + 2x = x + 2 + x$